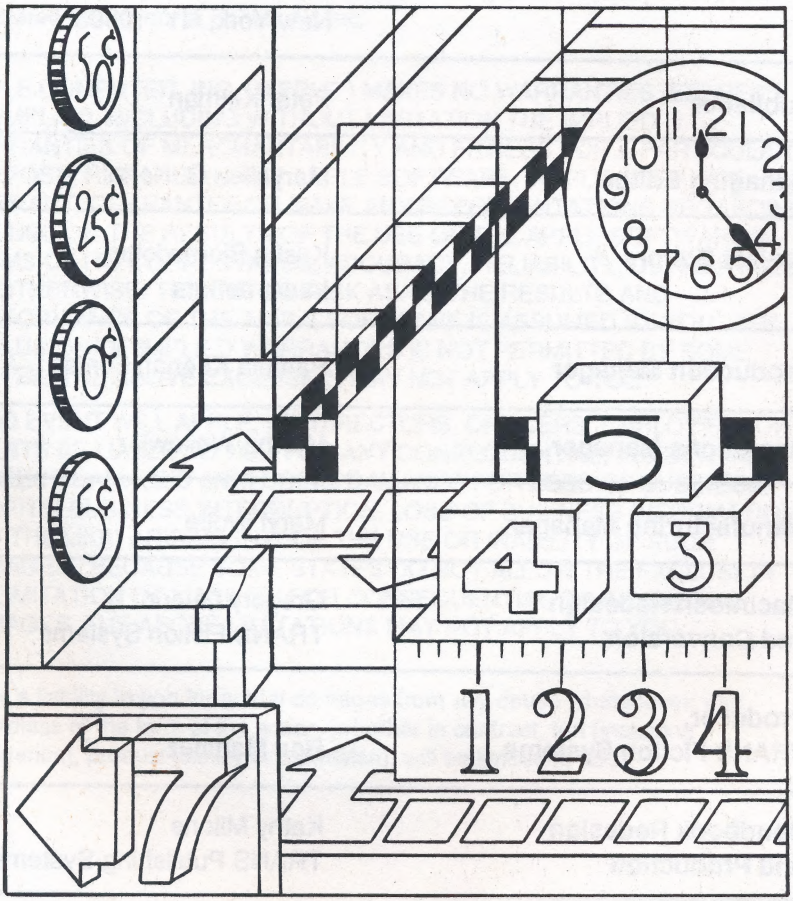
MATH SHOP® JR.



by Cary Hammer

SCHOLASTIC

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INTRODUCTION

The shops in the *Math Shop Jr.* mall are at a stand still. The store-keepers need workers, and your child can help! This is no ordinary shopping mall. In the *Math Shop Jr.* mall, shoppers browse for yo-yos and gizmos. Your child will fill shoppers' orders by using a variety of basic math skills.

Where does the work begin? Children can start by packing candles in the candle shop or adding bunches of flowers at the flower shop. Or if they prefer, there's an opening at the spider shop, subtracting spiders. They can also work on rug dimensions at the rug shop, or calculate travel time at the taxi company. The longer they work in each store, the more difficult the work becomes.

Work in the *Math Shop Jr.* mall can be timed or not timed. In the One Shop game, children can work as long as they like, serving as many customers as they please.

In the One Shop With Clock game, children work against the clock, from 9:00 to 5:00, serving as many customers as they can during a simulated shopping day.

When they've gained some experience in each of the shops, children can try the All Shops game. Customers line up for help in all 10 shops. Children are rewarded for good work with the honor of putting their names on the list of Top Ten Employees.

In the *Math Shop Jr.* mall, children can explore all facets of a given problem. The computer automatically does some of the calculations, allowing children to focus more on analyzing the problem itself. They can see the numbers involved; think about how, why, and where a given answer doesn't work; try a new solution; and immediately see their results. *Math Shop Jr.* can be a useful motivator for children not yet interested in math, or an exciting challenge for those who like to test and improve their problem-solving skills.

What's in This Package?

Along with this handbook, your *Math Shop Jr.* package includes the following components:

- The *Math Shop Jr.* program disk
- The Color Graphics disk
- Two Legal Copy labels

Equipment Needed

To use *Math Shop Jr.*, you need the following equipment:

- A Macintosh® Plus, SE, LC, Classic, or II computer
- System Software 6.0.2 or higher
- Two blank disks for making a Legal Copy of the program

NOTE: The Math Shop Jr. *package contains both black and white, and color graphics. If you are using the program on a monochrome Macintosh, you will only use the program disk. If you are using the program on a color Macintosh, you will use both the program disk and the Color Graphics disk. To use the color version, you must have either a hard disk or two high-density floppy disk drives. Using a hard disk, copy both the program disk and the Color Graphics disk onto it and run the program from there. Using two high-density floppy drives, copy both the program disk and the Color Graphics disk onto one high-density disk. Then run the program by inserting the system disk into one drive and the disk containing the program and the color graphics into the other drive.*

Making a Legal Copy of *Math Shop Jr.*

The disks included in the *Math Shop Jr.* package are Archival disks. Follow the instructions below for previewing the disks, or for making a Legal Copy once you have purchased the program.

For a complete description of your rights and responsibilities in copying disks and using the program, see the Scholastic Software License and Warranty Agreement included in this package. Scholastic also encourages you to read the Guide to Software Copyright Policies and Ethics on page 36.

The disks in this package are fully protected by copyright law. It is against the law to copy or in any way duplicate the disks or any portion of the program except under the terms expressly stated in these instructions and in the Scholastic Software License and Warranty Agreement.

Previewing *Math Shop Jr.*

You are invited to preview *Math Shop Jr.* for up to 30 days before you decide whether or not to purchase the program. To protect the Archival disks, please make a temporary Legal Copy of the program and use it to preview *Math Shop Jr.* Please note that the Legal Copy labels should not be affixed to the temporary Legal Copy unless you decide to purchase the program, and the temporary Legal Copy must be erased at the end of the 30-day period if you decide not to purchase the program.

Once You Have Purchased *Math Shop Jr.*

Once you have purchased the *Math Shop Jr.* package, you must make a Legal Copy of the Archival disks. You may not use the Archival disks for running the program. Use the Legal Copy instead.

MAKING A LEGAL COPY WITH ONE DISK DRIVE

1. Insert your Macintosh system disk into the drive.
2. Turn on the computer. The system icon will appear.
3. Choose Eject from the FILE MENU, to eject the system disk.
4. Insert the *Math Shop Jr.* program disk. The disk icon will appear.
5. Choose Eject from the FILE MENU to eject the program disk.
6. Insert a blank, initialized disk. The disk icon will appear.

7. Drag the *Math Shop Jr.* disk icon over the blank disk icon. A dialog box will appear asking you if you are sure you want to replace the contents of the blank disk (in drive) with the contents of the *Math Shop Jr.* disk (not in drive).
8. Click OK. The copying process will start.
9. When the disk has been copied, eject the *Math Shop Jr.* disk by dragging it into the Trash.
10. Affix the Legal Copy label to the disk.
11. Store the Archival disk in a safe place with a copy of Software License and Warranty Agreement.
12. Repeat Steps 4–11 to make a Legal Copy of the Color Graphics disk.

MAKING A LEGAL COPY WITH TWO DISK DRIVES

1. Insert your Macintosh system disk into a drive.
2. Turn on the computer. The system disk icon will appear.
3. Choose Eject from the FILE MENU to eject the system disk.
4. Insert the *Math Shop Jr.* program disk in one drive and a blank initialized disk in the other drive. Disk icons for both disks will appear.
5. Drag the *Math Shop Jr.* program disk icon over the blank disk icon. A dialog box will appear asking you if you want to replace the contents of the blank disk with the disk contents of the *Math Shop Jr.* disk.
6. Click OK to start the copying process.
7. When the disk has been copied, eject both disks by dragging them, one by one, into the Trash.
8. Affix the Legal Copy label to the disk.

9. Store the Archival disk in a safe place with a copy of the Software License and Warranty Agreement.

10. Repeat Steps 4–9 to make a Legal Copy of the Color Graphics disk.

MAKING A LEGAL COPY ONTO A HARD DISK

You are permitted to install the *Math Shop Jr.* Archival disks on one hard disk. If you want to install the program on multiple hard disks, you must buy multiple copies of *Math Shop Jr.* Follow the instructions below for copying the program onto a hard disk.

1. Turn on your computer (and your hard disk, if they are separate). Wait for the system to load into the computer.

2. Insert the *Math Shop Jr.* program disk into the floppy drive. The *Math Shop Jr.* disk icon will appear.

3. Drag the *Math Shop Jr.* disk icon onto the hard disk icon. If you get a dialog box saying that the disk must be copied into a folder, click OK.

4. Eject the Archival disk and store it in a safe place with a copy of the Software License and Warranty Agreement.

5. If you have a Macintosh with a color monitor, repeat Steps 2–4 to copy the Color Graphics disk onto your hard disk. Put the contents of the two disks in a folder on your hard disk.

DEFECTIVE DISKS

If the Legal Copy disk becomes damaged or defective, try recopying the program from the Archival disk to the Legal Copy disk. If the program still does not work, the Legal Copy disk may be defective. In this case, copy the program from the Archival disk onto another disk as a temporary Legal Copy. Then send the defective Legal Copy disk to Scholastic at the address below for a free replacement. When you receive the replacement, erase the temporary Legal Copy that you made.

If an Archival disk is damaged or defective, send it to Scholastic at the following address for a free replacement:

Scholastic Software
Scholastic Inc.
2391 E. McCarty St.
Jefferson City, MO 65102

In Canada:
Software from Scholastic
Richmond Hill, Ontario
Canada, L4C 3G5

In Australia:
Ashton Scholastic Software
P.O. Box 579
Gosford NSW 2250
Australia

Loading *Math Shop Jr.* From a Floppy Disk Drive

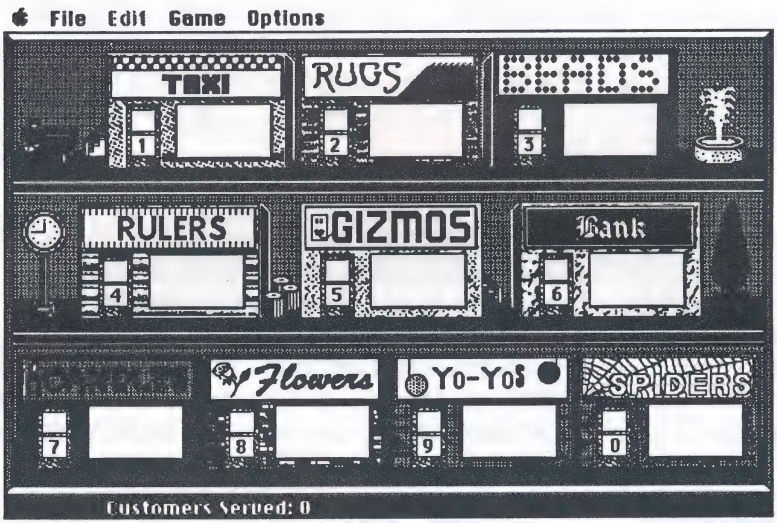
1. Insert your Macintosh system disk into the drive.
2. Turn on the computer. The system disk icon will appear.
3. If you have a single disk drive, choose Eject from the FILE MENU. Remove the system disk and insert the *Math Shop Jr.* program disk. If you have two drives, insert the *Math Shop Jr.* program disk in the second drive. The *Math Shop Jr.* disk icon will appear.
4. Double-click the *Math Shop Jr.* disk icon. The disk window will open.
5. Double-click the *Math Shop Jr.* program icon. The program will load.

Loading *Math Shop Jr.* From a Hard Disk

1. Turn on your computer and hard disk. Wait for the system to load into the computer.
2. Double-click the hard disk icon. The hard disk window will open.
3. Double-click the *Math Shop Jr.* program icon to load the program.

Getting to Work

When you have loaded the program, you will see the three-story *Math Shop Jr.* mall.



To begin work, click one of the storefronts. You will enter that store and begin your job. However, before starting the game, you might want to explore the options in the menu bar at the top of the screen. The following is a brief description of each menu.

APPLE MENU

ABOUT *MATH SHOP JR.*

Read About *Math Shop Jr.* to become familiar with the overall features of the program.

ABOUT COPYING...

About Copying explains Scholastic's policy on copying this software.

FILE MENU

QUIT ⌘Q

Choose Quit to leave the program and return to the desktop.

EDIT MENU

You cannot use the edit commands in *Math Shop Jr.* Therefore, they are dimmed.

GAME MENU

ONE SHOP ⌘1

In this game, you can enter any store of your choice and serve customers at your own pace. The "Customers Served" number, which appears at the bottom of the screen, keeps track of the number of customers that have been served. The game ends when you return to the mall.

ONE SHOP WITH CLOCK ⌘2

This game is similar to the One Shop game, except that there is a clock at the bottom of the screen which keeps track of the time from 9:00 to 5:00. The idea is to serve as many customers as possible during a 9-to-5 shopping day. The actual time from 9:00 to 5:00 is approximately five to eight minutes. When 5:00 comes around, the shop automatically closes and the game is over. The "Customers Served" number shows you how many customers were served.

ALL SHOPS ⌘3

In the All Shops game, you serve as many customers as possible in all 10 shops. When the game starts, there are customers waiting to be served in many of the shops, and more customers keep arriving. When the 10th customer arrives in a shop, all the customers grow impatient and leave. The game ends when the "Customers Lost" number at the bottom of the mall screen shows that 50 customers have left the mall. The "Customers Served" number shows the total number of customers served in all the shops. When the game ends, this number is the final score.

If you do well in the All Shops game, you may earn the honor of placing your name on the list of famous *Math Shop Jr.* workers. For more information, turn to the Top Employees List section on page 17.

OPTIONS MENU

CAN'T USE COLOR IMAGES

This option will be dimmed if you have a Macintosh computer with a monochrome monitor, you have not installed the Color Graphics onto your hard disk, or your color Macintosh does not have enough available memory to run the program in color.

USE COLOR IMAGES ⌘I

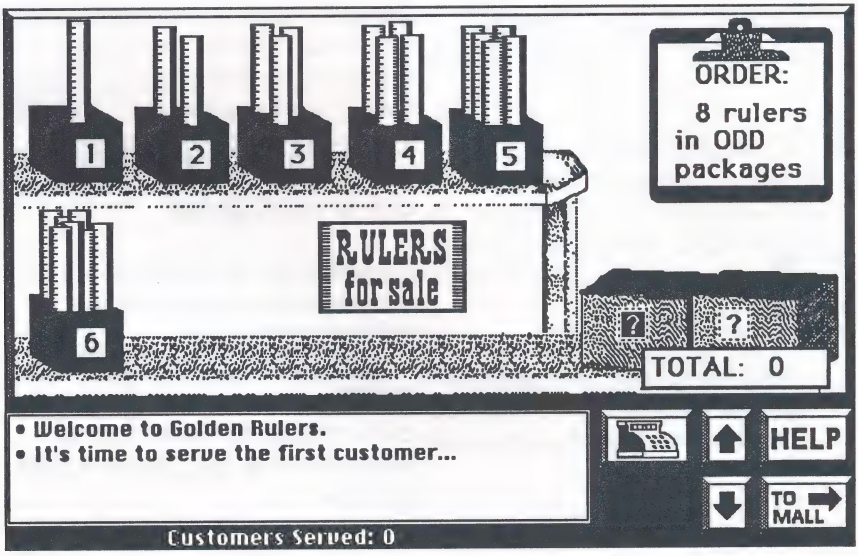
If you have a color Macintosh, you will see the Use Color Images option. This option toggles between color and black and white graphics.

DON'T PLAY SOUNDS ⌘D

Choose Don't Play Sounds when you wish to play with no sound.

The Control Panel

Each shop has a control panel. You can use both the mouse and the keyboard to issue the control panel commands. (For a complete list of all keypresses in the program, see the Keys to Know section on page 19.)



Look in the message box for messages about each problem you are solving and about the arrival of new customers.

Click the Cash Register button to serve a customer.

When you play the One Shop With Clock game, the time will be displayed under the Cash Register button. You have from 9:00 to 5:00 to complete a work day. The actual playing time is from five to eight minutes.

When you are playing the All Shops game, you will see a Crowd sign under the Cash Register button. The Crowd sign will be dimmed when all stores in the mall have less than seven customers. When you are working in a store and the Crowd sign flashes and stays lit, it means that there is a crowd (at least seven customers) in one or more stores.

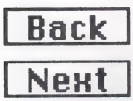
Click the Up Arrow button to increase the number in the active number box.

NOTE: In the yo-yo shop, you click the Up Arrow button to change No to Yes in the active number box.

Click the Down Arrow button to decrease the number in the active number box.

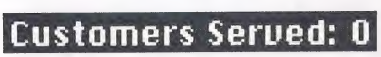
NOTE: In the yo-yo shop, you click the Down Arrow button to change Yes to No in the active number box.

Click Help to see instructions for a shop. The Help instructions appear in the message box.



Click the Back and Next buttons below the message box to browse through the instructions. Look for outlined items on the screen as you read through the instructions. When you are ready to play the game, click Cancel Help.

Click the To Mall button to go back to the mall.



This displays the number of customers you have served when you are playing the One Shop game or the One Shop With Clock game.

When you are playing the All Shops game, this shows the number of customers waiting in the shop you are working in.

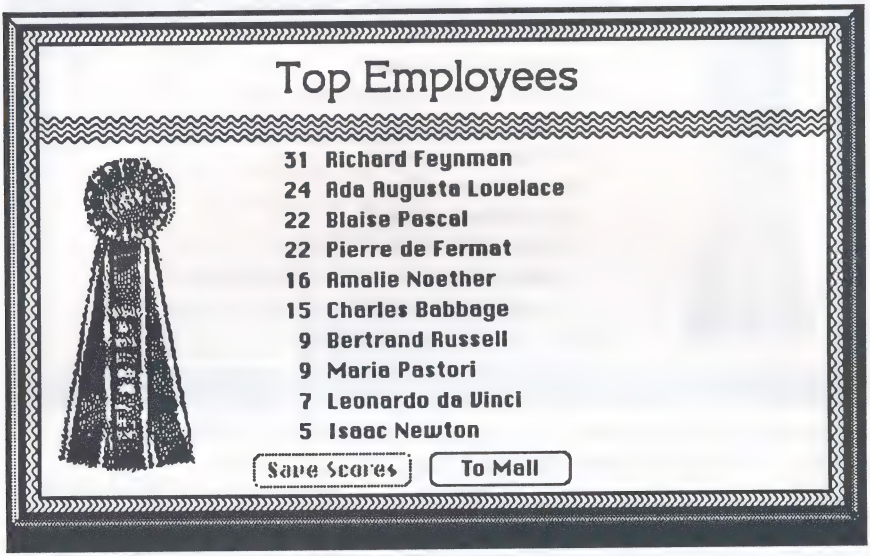
Tips for Playing the All Shops Game

Here are some playing strategies for the All Shops game:

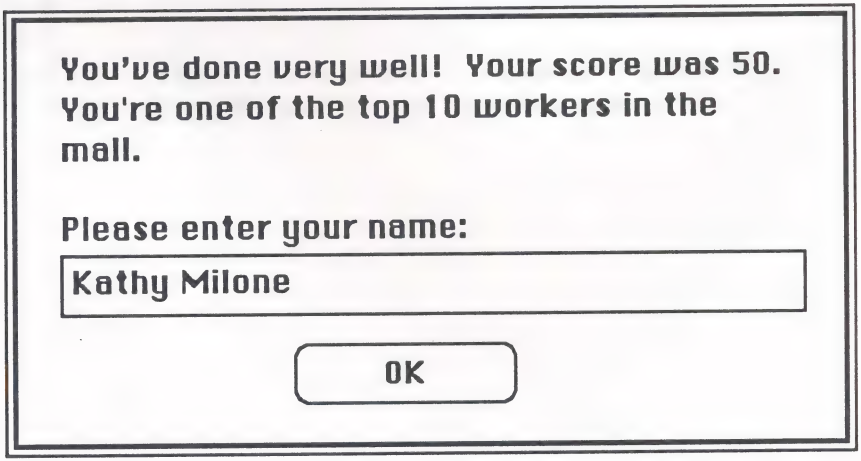
1. Head for the more crowded stores first. The more customers there are waiting in a line, the closer the store is to being overcrowded.
2. Serve at least a few of the customers at each shop, even if you think some shops are more difficult than others. Remember, at any shop, the first customers are the easiest ones to serve. Even if you serve only three customers, you will delay overcrowding. This will give you more time to help in the other, easier stores.
3. A store can never overcrowd while you're working there. You can let a store line build up to nine customers, and if you arrive there before the 10th customer, you can stay there and work without worrying that it will overcrowd while you're there.
4. As you play the All Shops game, write down the names of the stores that give you trouble. Then switch to the One Shop game, and choose each of those stores for practice. After a few practice sessions, try the All Shops game again. You should find that your score improves.
5. When a store in the mall has seven or more customers waiting, the crowd sign on the control panel will flash and light up. When the crowd sign is lit, a good strategy is to leave the store you are in and go to a more crowded one.

Top Employees List

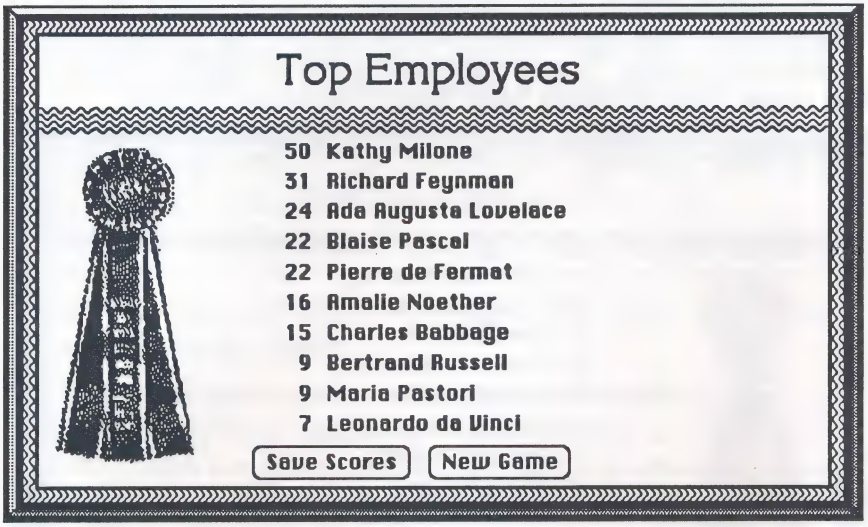
Math Shop Jr. keeps track of its best employees and displays their names on the Top Employees list. To see this list, click the fountain in the mall. You can add your name to this list if your final score in an All Shops game beats a score on the list.



If your final score in an All Shops game qualifies for the Top Employees list, the following message will appear on the screen:



Enter your name and click OK. Your name and score will appear on the list.



If you want to save your name to the list, click the Save Scores button. Then click New Game to return to the mall.

*NOTE: To clear the Top Employees list and return it to the original list of famous mathematicians, press Option–Shift and click the ribbon, or press Option–Shift–**C**.*

Keys to Know

This section contains a complete list of the *Math Shop Jr.* keypress commands. Keep it beside your computer as a quick reference if you want to use the keyboard to issue commands.

In the Mall

PRESS	TO
1	Enter the taxi shop.
2	Enter the rug shop.
3	Enter the bead shop.
4	Enter the ruler shop.
5	Enter the gizmo shop.
6	Enter the bank.
7	Enter the candle shop.
8	Enter the flower shop.
9	Enter the yo-yo shop.
0	Enter the spider shop.

Menu Bar

PRESS	TO
⌘–Q	Quit.
⌘–1	Play the One Shop game.
⌘–2	Play the One Shop With Clock game.
⌘–3	Play the All Shops game.
⌘–I	Toggle between color and black and white images.
⌘–D	Toggle between sound and no sound.

In the Shops

PRESS	TO
Return	Serve a customer.
↑	Add to the number in the active number box.
↓	Subtract from the number in the active number box.
H	Read instructions.
B	Go to previous Help card.
N	Go to next Help card.
C	Cancel Help.
T or **M**	Return to mall.
Tab or Space Bar	Move between number boxes.

List of Shops and Skills

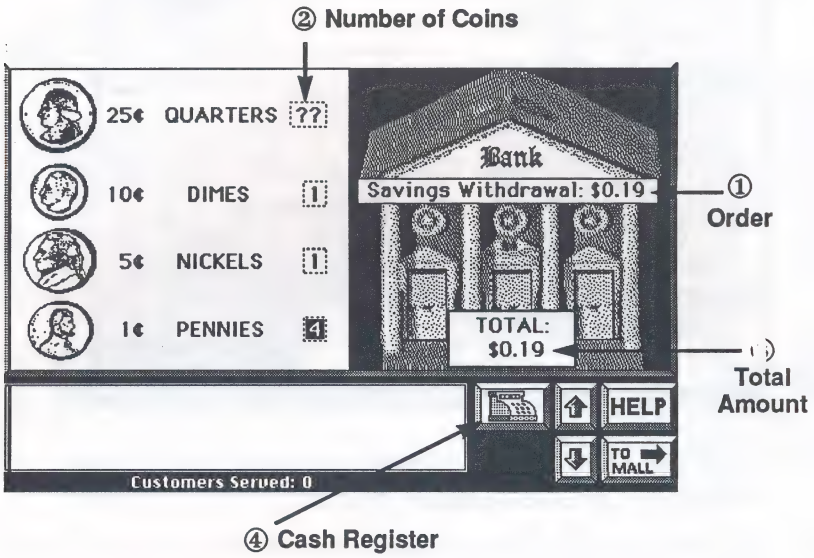
SHOP	CONCEPTS AND SKILLS
Bank	• Identifying the values of coins • Addition and subtraction
Beads	• Mathematical estimation • Visual estimation • Addition and subtraction
Candles	• Finding a missing addend • Addition and subtraction
Flowers	• Addition and subtraction
Gizmos	• Multiplication and division
Rug	• Area • Multiplication and division
Rulers	• Identifying odd and even numbers • Addition and subtraction
Spiders	• Addition and subtraction
Taxi	• Reading a digital clock • Adding and subtracting hours and minutes
Yo-yos	• Addition and subtraction

GUIDE TO THE SHOPS

This section contains one page of information for each of the *Math Shop Jr.* shops. This information includes illustrated instructions for working in the shop and a sample problem. The instructions assume that you are using the mouse to control the program. If you want to use the keyboard commands, you may want to refer to the Keys to Know section, on page 19, as well.

Bank

At the Small Change Bank, a lot of customers are taking money out of their savings accounts. Your job is to give the customers the money they ask for.



① This shows you how much money the customer wants to withdraw. In this example, it is $0.19.

② Here you enter the number of quarter, dimes, nickels, and pennies you want to give the customer. For this example, the amount needed is: 1 dime, 1 nickel, and 4 pennies (10¢ + 5¢ + 1¢ + 1¢ + 1¢ + 1¢ = $0.19).

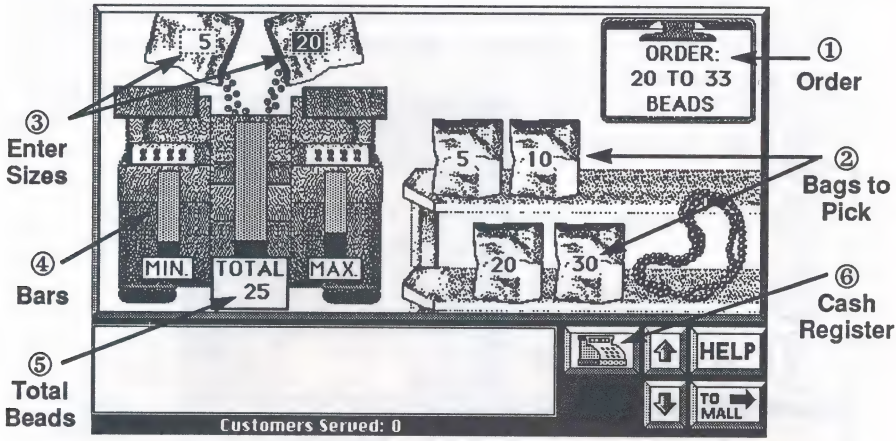
③ You will see the total amount of money here. The total must be the same as the withdrawal order, just like it is in this example.

④ When the total is the same as the order, click the Cash Register button to serve the customer.

When you have worked in the bank for a while, you will have to give customers their money using as few coins as possible.

BEADS

At Bumble Beads, customers order lots of beads. Your job is to make sure that customers get enough beads, but not too many.



① This is the order. In this example, the customer wants between 20 and 33 beads.

② You pick two of the bead bags and pour them into the Bead Counting Machine.

③ Enter the sizes of the two bags you pick. For this example, the bags holding 5 and 20 beads have been chosen.

④ The bars on the Bead Counting Machine help you see if you have picked the right number of beads. The total bar shows you how many beads are in the machine. If this bar is shorter than the minimum bar, you are not giving the customer enough beads. If the bar is taller than the maximum bar, you are giving the customer too many beads.

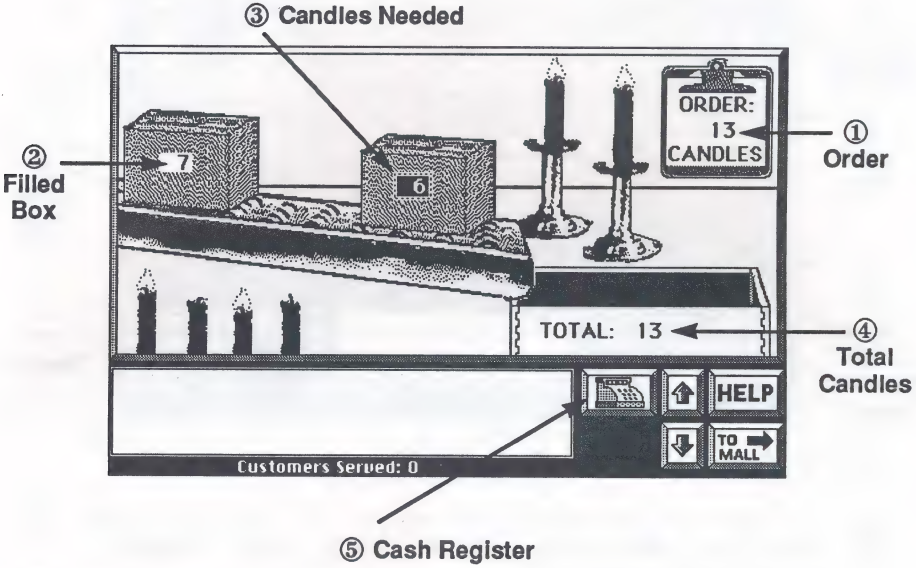
⑤ Here you'll see the total. In this example, it is 25. When this number is between the numbers in the order, or equal to one of them, you are ready to serve the customer.

⑥ Click the Cash Register button to serve the customer.

After the first few customers, you'll get five new bead bags. Later, two more bags will be added.

CANDLES

At Lydia's Candle Shop, customers order candles in boxes. Your job is to fill the empty candle boxes.



① This is the order. In this example, the customer wants 13 candles.

② This box is already filled for you. In this example, the box has 7 candles.

③ You must figure out how many more candles are needed. When you know the answer, you enter the number here. For this order, the answer is 6 (7 + 6 = 13).

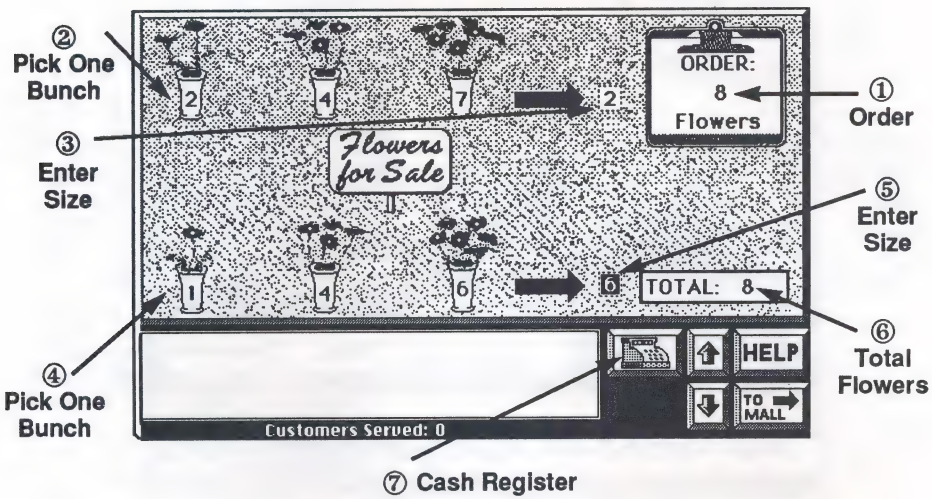
④ You will see the total number of candles here. The total must be the same as the order, just like it is in this example.

⑤ When the total is the same as the order, click the Cash Register button to serve the customer.

Later, you will have two full boxes of candles and one empty box.

Flowers

At Flea's Flower Shop, customers order flower bouquets of different sizes. Your job is to decide which of the flower bunches on the shelves will make up the right bouquet.



① This is the order. In this example, the customer wants 8 flowers in a bouquet.

② First you pick one of these bunches.

③ Enter the size of the bunch here. In this example, the bunch with 2 flowers has been picked.

④ Then you pick one or these bunches.

⑤ Enter the size of the bunch here. In this example, the bunch with 6 flowers has been picked (2 + 6 = 8).

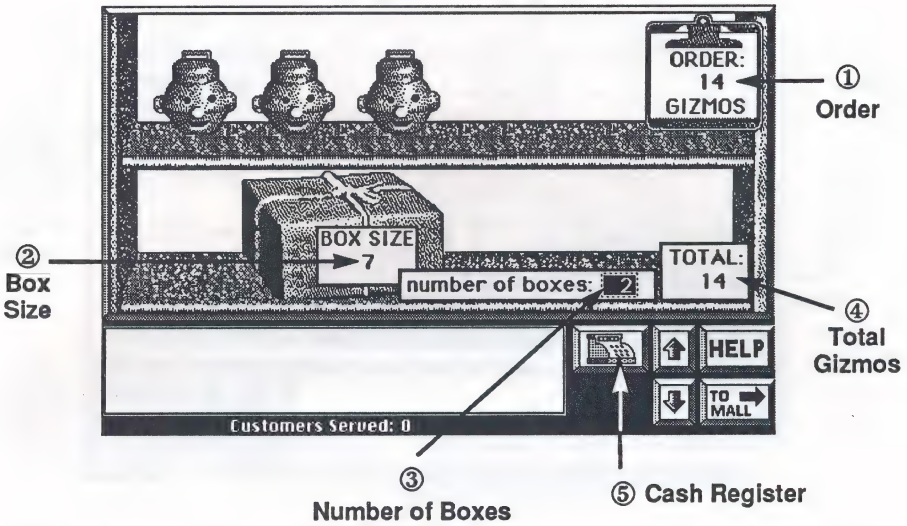
⑥ You will see the total number of flowers here. The total must be the same as the order, just like it is in this example.

⑦ When the total is the same as the order, click the Cash Register button to serve the customer.

Later, you will have three shelves of flower bunches.

GIZMOS

At Gizmos Galore, customers buy lots of gizmos. Your job is to make sure that they get the right number of gizmos.



① This is the order. In this example, the customer wants 14 gizmos.

② This tells you how many gizmos there are in a box. In this example, the box has 7 gizmos.

③ How many boxes do you need to give the customer? You will enter the number here. In this example, 2 boxes are needed (2 x 7 = 14).

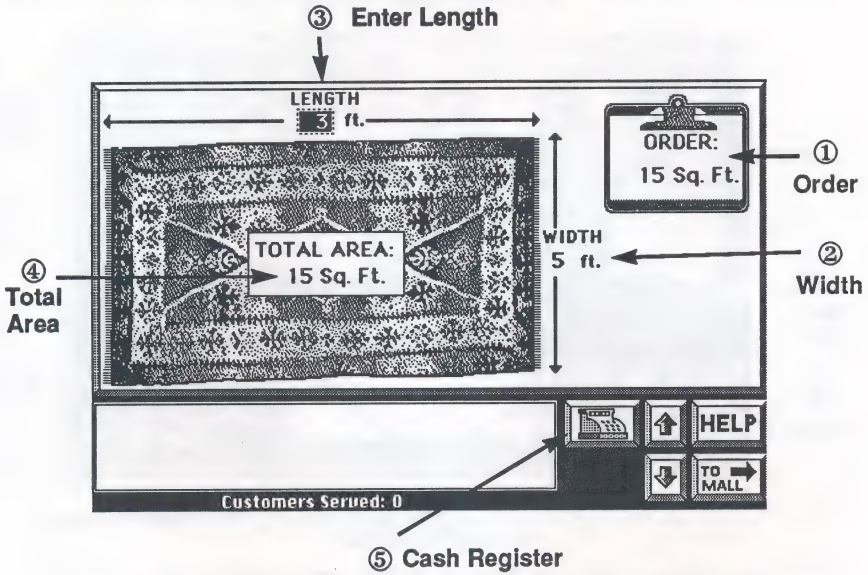
④ You will see the total number of gizmos here. The total must be the same as the order, just like it is in this example.

⑤ When the total is the same as the order, click the Cash Register button to serve the customer.

After the first few customers, you will have two different boxes to choose from. First you choose the size of the box you want and then you decide how many boxes of that size to use. Later, there will be four boxes to choose from.

RUGS

At the Rugs to Riches Shop, rugs are measured in square feet. Your job is to give the customers the right rug size.



① This is the order. In this example, the customer wants a 15-square-foot rug.

② This tells you how wide the rug is. In this example, the rug is 5 feet wide.

③ You decide how long the rug should be and enter the number here. In this example, the length should be 3 feet (3 feet x 5 feet = 15 square feet).

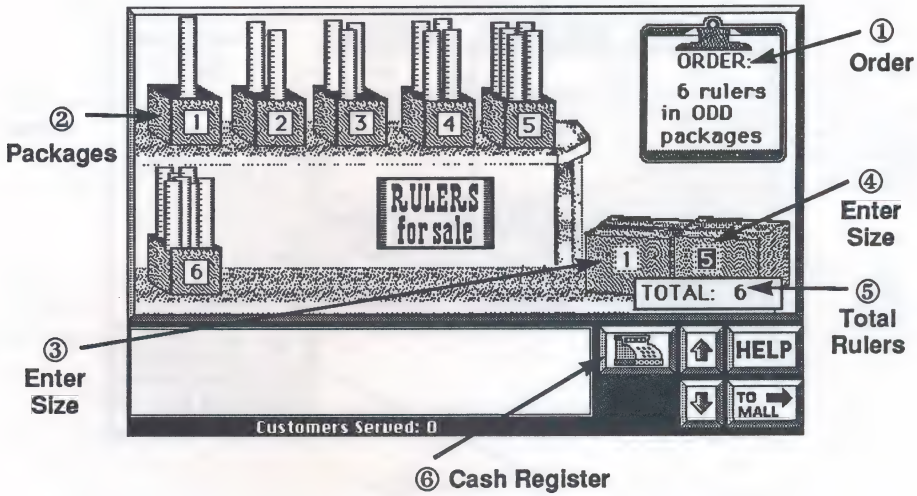
④ This is the total area of the rug. The total area must be the same as the order, just like it is in this example.

⑤ When the total area is the same as the order, click the Cash Register button to serve the customer.

Later, you will decide on both the length and the width. Each number will have to be larger than a given minimum.

RULERS

At the Golden Rulers Shop, customers are picky. They want rulers in odd or even packages. Your job is to give them the right ruler packages.



① This is the order. In this example, the customer wants 6 rulers in odd packages.

② Pick two of the packages on the shelves.

③ Here you enter the size of one of the packages. Remember, this customer asked for odd packages. In this example, the odd package chosen is 1. It could also be 3, or 5.

④ Here you enter the size of the other odd package. In this example, it is 5 (1 + 5 = 6).

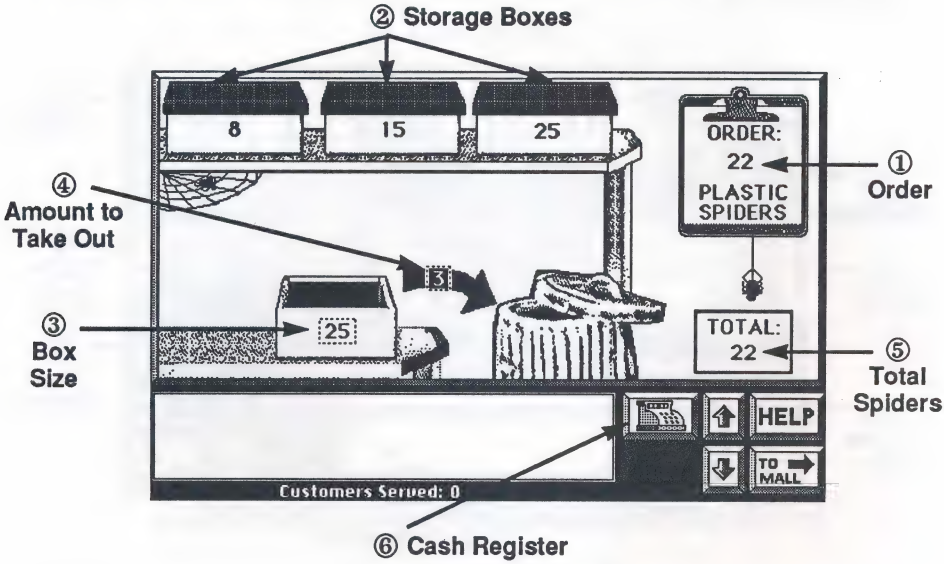
⑤ You will see the total number of rulers here. The total must be the same as the order, just like it is in this example.

⑥ When the total is the same as the order, click the Cash Register button to serve the customer.

Soon, you will have more ruler packages to choose from. Later, you will have to pick three ruler packages at a time, instead of two.

SPIDERS

At the Itsy Bitsy Spider Shop, customers line up to buy plastic spiders. Your job is to give them the right number of spiders.



① This is the order. In this example, the customer wants 22 plastic spiders.

② The spiders are stored in these boxes. None of the boxes are the right size. You must choose one box and take some spiders out.

③ Choose a box and enter its size here. For this example, you would choose the box with 25 plastic spiders.

④ How many spiders do you have to take out of the box to equal the order? Enter the number here. In this example, you would take out 3 plastic spiders (25 - 3 = 22).

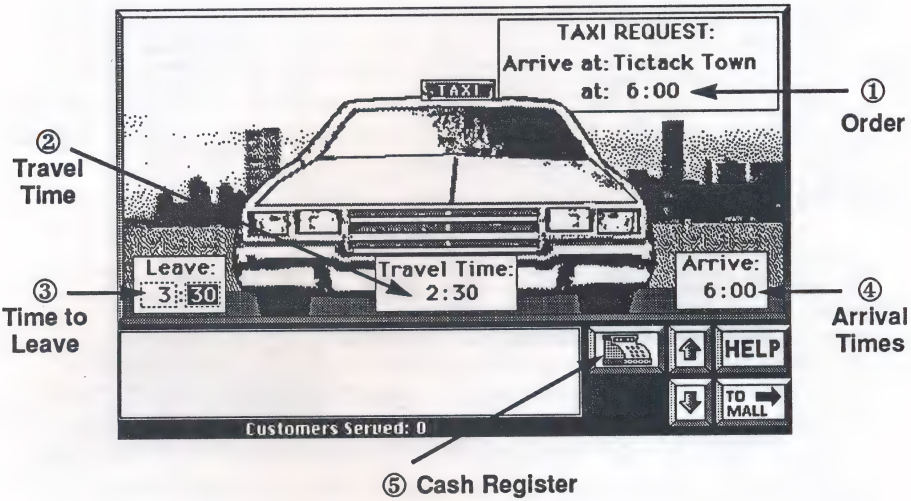
⑤ You will see the total number of spiders here. The total must be the same as the order, just like it is in this example.

⑥ When the total is the same as the order, click the Cash Register button to serve the customer.

After a while, you will have six boxes of spiders to choose from.

TAXI

At the Dallas Taxi Company, customers are going places. Your job is to make sure that they leave and arrive at the right time.



① This is the taxi request form. It tells you what time the customers want to arrive at their destination. In this example, the customer wants to arrive at 6:00 (6 o'clock).

② The travel time appears here. For this example, the travel time is 2:30 (2 hours and 30 minutes).

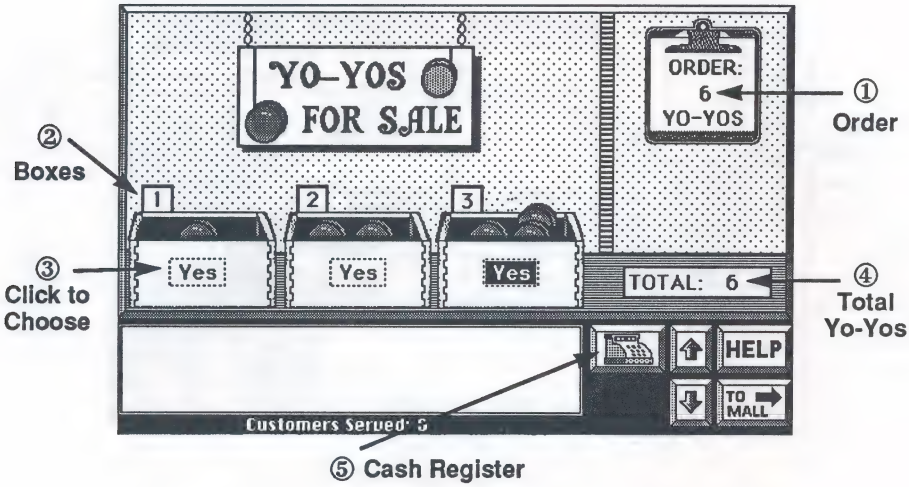
③ When does the taxi have to leave to arrive on time? Enter the time here. For this example, the customer must leave at 3:30.

④ This is the time of arrival. This time must be the same as the time on the taxi request form, just like it is in this example.

⑤ When the time of arrival is the same as the time on the request form, click the Cash Register button to serve the customer.

Yo-Yos

At Lila's Yo-yo Shop, the yo-yo's are sold in boxes. Your job is to decide which yo-yo boxes to give to each customer.



① This is the order. In this example, the customer wants 6 yo-yos.

② Here are the three yo-yo boxes you choose from.

③ To choose a box, click No below the box and No will change to Yes. If you change your mind, click Yes and it will change to No. In this example, all three boxes are chosen (1 + 2 + 3 = 6).

④ You will see the total number of yo-yos here. The total must be the same as the order, just like it is in this example.

⑤ When the total is the same as the order, click the Cash Register button to serve the customer.

Soon, two more boxes of yo-yos will appear, and you will have five boxes to choose from. Later, a sixth box will be added.

Why *Math Shop Jr.*?

by Cary Hammer

Mathematics is a subject about which most elementary and high school students tend to have strong feelings. In the average school, a small percentage of students have a fascination as well as a seemingly effortless facility with the workings of numbers. Conversely, a great proportion confess complete bafflement with the very notion of math, and thus a total lack of interest in the subject. What is striking is how few students fall somewhere between these two extremes. Why is it that mathematics, perhaps more than any other academic field of study, is such an all-or-nothing proposition?

Perhaps a clue is to be found in children's differing views of what math is all about. Some see it as an elegantly logical and endlessly fascinating game. Others consider math to be an arbitrary and restrictive set of rules, under the domain of which any given task is a tedious and meaningless chore. While these two views are perhaps equally valid, it is clear that the child who sees the game buried beneath the numbers is likely to dig more deeply into them. A child who views a learning experience as fun and relevant is more likely to develop a positive attitude toward the subject. But it is in the field of mathematics that this viewpoint seems to vary to the greatest degree.

Mathematical attitude affects mathematical aptitude. The educational problem is one of determining how best to encourage the proper frame of mind. In mathematics, the extent to which a child views a given exercise as entertaining is largely dependent on the ease with which he or she can perform the low-level number manipulations involved. The child who must agonize over the basic arithmetic operations necessary in tackling a complex rate-time-distance problem is much less likely to appreciate the final elegance of its solution. However, the child for whom the processes of addition and subtraction are more automatic tends to focus the bulk of his or her attention on the more interesting problem-solving aspects of the task.

In considering these sorts of learning situations, the difference between computers and pencils becomes particularly clear. Unlike a pencil, a computer can automatically handle the more tedious elements of a math problem, freeing a child to concentrate on the higher-level logic involved. Thus, it is this approach of decreasing the distractions along the way to effective mathematical problem solving that I have used as the focus of *Math Shop Jr.*

Math Shop Jr. is a vehicle for honing arithmetic skills, in addition to developing problem-solving techniques. However, enough of the burden of arithmetic computation has been shifted to the machine to allow children to more easily see the overall dynamics of each type of problem. Due to the spreadsheet-like structure of *Math Shop Jr.*, when a child enters a possible answer to a given problem, he or she immediately sees how this value affects every aspect of the problem. Just as an executive, using a spreadsheet program to rework a financial plan, can see how a lowered production cost would affect all segments of the budget, the child is given a broad vantage point on the problem. Thus, the child is never merely told that he is wrong; instead he or she is allowed to observe, to his or her own satisfaction, exactly why a given answer doesn't work.

In addition, the problems posed by *Math Shop Jr.* are framed in a visual, rather than verbal, context. Each challenge is presented in the form of a graphic screen depicting the real-world setting of the problem, such as a pharmacy or a grocery store. This allows the child to more easily perceive the structure of the task, and encourages a specific organizational method for its solution.

Perhaps the most apparent dimension of *Math Shop Jr.* is the gamelike framework which offers an incentive for problem solving. This type of structure is an ideal context in which to present math problems, as the average child needs little coaxing to try a new game. However, *Math Shop Jr.* is not the typical computer game in which the child pilots a colorful flying saucer through the galaxy while shooting down equally-colorful enemy creatures, occasionally earning more fuel by correctly solving algebraic equations.

This method promotes the sort of "do your work and you'll get some candy" approach that immediately cues the child that the task at hand is so inherently dull that it requires an artificial reward. The child's attention and interest consequently are focused toward flying saucers and away from the numbers.

The design strategy underlying *Math Shop Jr.* takes a different tack. Rather than creating an entertaining game, and then searching for holes into which math problems can be force-fit, I think it is better to work in the opposite direction. By beginning with the mathematical concepts, and working from the logical challenges which make them intriguing and gamelike in and of themselves, I have tried to build an overall game structure which is integrative with, rather than distracting from, the primary concepts. I hope *Math Shop Jr.* will demonstrate that, given free rein to show off, and the proper stage on which to perform, mathematics can be entertaining enough in itself without being dressed up in silly costumes.

Mathematics is a science of finding that which is not completely hidden; that which is only obscured by complexity. Sadly, the entertaining nature of mathematics itself can be one of its most darkly obscured truths. Hopefully, *Math Shop Jr.*, by presenting mathematics in a different light, will help children to uncover this all-too-well-kept secret.

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